



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,788	10/31/2003	David R. Hembree	99-0812.3	1707

22823 7590 02/04/2005

STEPHEN A GRATTON  
THE LAW OFFICE OF STEVE GRATTON  
2764 SOUTH BRAUN WAY  
LAKEWOOD, CO 80228

EXAMINER

MENZ, DOUGLAS M

ART UNIT PAPER NUMBER

2829

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/698,788

Applicant(s)

HEMBREE ET AL.

Examiner

Douglas M. Menz

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 47-67 is/are pending in the application.
- 4a) Of the above claim(s) 53-67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 47-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/15/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 47-52 are rejected under 35 U.S.C. 102(e) as being anticipated by Elenius et al. (US 6287893).

Regarding claim 47, Elenius discloses a semiconductor component comprising:

A semiconductor die (10) having a face and a plurality of die contacts (18) on the face in a pattern (Figs. 1-2 and Col. 6, lines: 2-30);

An electrically insulating layer (22) on the face (Fig. 2 and Col. 6, lines: 25-35);

A plurality of redistribution conductors (30) on the layer in electrical communication with the die contacts (18) configured to redistribute the pattern of the die contacts (Figs. 1-2 and Col. 7, lines: 5-50);

Art Unit: 2824

An electrically insulating outer layer (33) on the conductors and the layer having a plurality of openings aligned with selected portions of the conductors configured in an area array (Figs. 1-2 and Col. 7, lines: 49-60); and

A plurality of bumped contacts (28) in the openings bonded to the selected portions of the conductors (Figs. 1-2 and Col. 7, line 60 – Col. 8, line 28), the outer layer and the openings configured as a mask for forming the bumped contacts on the selected portions and for preventing bridging between the bumped contacts (Col. 8, lines: 1-28).

Regarding claim 48, Elenius further discloses wherein the outer layer (33) comprises a photoimageable material (Col. 7, lines: 49-60).

Regarding claim 49, Elenius further discloses wherein the outer layer (33) is patterned to cover only selected areas on the face of the die (Col. 7, lines: 49-60).

Regarding claim 50, Elenius further discloses wherein a depth of the openings is equal to a thickness of the outer layer (33) minus a thickness of the conductors (30) (Col. 6, lines: 38-45 states that layer (24) is optional, therefore if it were removed from figure 2 the depth of the openings would be equal to a thickness of the outer layer (33) minus a thickness of the conductors (30) since the conductor (30) does not extend to the far right edge of the die (10, Fig. 2).

Regarding claims 51-52, Elenius further discloses that the described redistribution process is for relocating the solder bumps anywhere on the surface of the device (Fig. 1 and Col. 7, lines: 35-48).

### ***Response to Arguments***

Applicant's arguments filed 11/15/04 have been fully considered but they are not persuasive.

Applicant's first argument is that Elenius does not teach the independent claim 47 amended limitation "the outer layer and the openings configured as a mask for forming the bumped contacts on the selected portions and for preventing bridging between the bumped contacts." Elenius discloses that the solder balls are placed on their respective solder bump pads by mechanical placement, plating, solder paste, evaporation, ball bumping and solder jetting (Col. 8, lines: 10-24). Once the solder balls are formed, **the package is heated to the reflow temperature of the solder balls** (28, Fig. 2 and Col. 8, lines: 24-28 and Col. 5, lines: 30-36). Therefore, it is clearly obvious that the outer layer (33) and the openings act as a mask for forming the bumped contacts on the selected portions (Fig. 2). Furthermore, it is inherent that the outer layer prevents bridging between the bumped contacts because it would otherwise render the device inoperable. Elenius even discloses that the structure permits larger diameter solder balls without risking that such balls will abut each other (Col. 4, lines: 20-25).

Art Unit: 2824

Applicant's second argument is that Elenius does not teach the dependent claim 48 amended limitation "the outer layer comprises a photoimageable material." Elenius discloses that the preferred material for layer 33 is Benzocyclobutene, however, other organic or inorganic passivation materials may be employed (Col. 7, lines: 50-55). Furthermore, **Elenius explicitly states that conventional photolithography techniques are used to form patterned openings within passivation layer 33 (Col. 7, lines: 55-60).** Therefore, it is clearly obvious that the outer layer comprises a photoimageable material.

Applicant's third argument is that Elenius does not teach the dependent claim 49 amended limitation "the outer layer is patterned to cover only selected areas on the face of the die." Elenius discloses that the outer layer (33) is patterned to form openings at the site of the solder bump pads (26, Fig. 2 and Col. 7, lines: 55-60). Therefore, the outer layer covers only the areas that are not within the openings i.e. the selected areas on the face of the die.

Applicant's fourth and final argument is that Elenius does not teach the dependent claim 50 amended limitation "a depth of the openings is equal to a thickness of the outer layer minus a thickness of the conductors." Col. 6, lines: 38-45 states that layer (24) is optional, therefore if it were removed from figure 2 the depth of the openings would be equal to a thickness of the outer layer (33) minus a thickness of the conductors (30) since the conductor (30) does not extend to the far right edge of the die (10, Fig. 2). Furthermore, applicant's Prior Art Figure 1A clearly shows that the depth of the openings (40) is equal to a thickness of the outer layer (38) minus a thickness of the

Art Unit: 2824

conductors (36, Prior Art Figure 1A). Therefore, applicant even concedes that such a limitation is known and practiced in the art.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M. Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2824

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM

A handwritten signature in black ink, appearing to read 'Bradley Baumeister', with a stylized, flowing script.

**BRADLEY BAUMEISTER  
PRIMARY EXAMINER**